

subject under the lens, into groups, exemplifying the intimate structure of each of the classes into which animals and plants have been divided, the chief points of structure being briefly described under each head in the "programme," which thus formed a biological text-book of twenty pages with real objects for illustration. This society, founded by Canon Kingsley, is doing exceedingly good work in limiting its operations to the natural history and geology of its own district, scrupulously defined on an ordnance map. The study of local biology is encouraged by the annual grant of 10*l.*, known as the Kingsley Memorial Prize, open to any resident within the Society's district; that of next year is offered for the best collection of "Slides of the Freshwater Algae of the Society's District, omitting the Diatoms." The Kingsley Memorial Medal this year was awarded to Mr. Shrubsole, F.G.S.

THE report on the progress and condition of the Botanic Garden and Government Plantations in South Australia for 1882, by the Director, Dr. Schomburgk, contains the usual amount of information on the introduction and cultivation of useful and ornamental plants. Dr. Schomburgk draws attention to the small rainfall for the year. He says that during 1881 it amounted to 18.192 inches, but during 1882 it only amounted to 15.742 inches, which was 5.469 inches below the general average (21 inches odd) of the previous forty-three years, the only years during which the rainfall was less than that of last year. During May and June severe frosts prevailed. The temperature was on several nights as low as 29° and 30°. These frosts had, of course, a disastrous effect upon plants in the gardens. "The tropical and subtropical trees and shrubs which had scarcely recovered from the frosts of 1881, especially the tropical *Ficus*, constituted the chief bulk of the sufferers; they have suffered materially, and they have been sadly reduced—from 30 feet and 40 feet in height, to 6 feet and 10 feet." As early as the latter end of September some very hot days were experienced, the thermometer showing 96° in the shade, and 120° in the sun, the highest temperature experienced in any former September. During December and January three slight showers of rain alone fell. Notwithstanding these checks to vegetation a considerable amount of work seems to have been done of a varied character. In the matter of useful plants we quote the following paragraph as an example:—"The demand by invalids for medical herbs becomes more frequent, and it is gratifying to be able to supply them. Inquiries are especially made for the following, viz.: the common English broom (*Cytisus scoparius*), of which a decoction is used in dropsy; the leaves of the mullein or shepherd's club (*Verbascum thapsus*), a decoction of the leaves being recommended by some of the American papers as a remedy against consumption; the globular sponge (*Euphorbia pilulifera*), a native of the tropical regions of the New and Old World. It is found growing in Queensland, and a decoction of the plant is said to be used with the best results in asthmatic complaints."

MR. F. S. MOSELEY, F.Z.S., writes to the *Times* to state that a Marmoset (*Haplorhina jacchus*) in his possession gave birth to two young ones on the 4th inst.; Mr. Moseley supposes this to be the first case of the kind in Europe.

A TELEGRAM received at Paris on Tuesday night from Algiers states that a strong shock of earthquake was felt at Philippeville at half-past one o'clock that morning. The oscillation was in the direction from north to south. At Jammasses the church and barrack walls were cracked; at Stora a house was also damaged.

A CORRESPONDENT residing at Accra, West Coast of Africa, sends some particulars of the recent earthquake at that place:—"It was at 2.30 a.m. on the morning of Sunday, August 12, that several shocks of earthquake were experienced. The

evening previous had been cool, with alternate periods of thick, hot air, which rather presaged a thunderstorm, it being the season of the year when tornadoes pass over the coast. On the night in question it was observed that the surf was particularly violent until half an hour prior to the first shock, when the water seemed to subside and become comparatively calm. The first shock was followed by a second and more violent shock, shaking the foundations. In each case the shock was preceded by an explosion resembling in a great degree the sound usually caused by the discharge of a gun from ships lying in the roadstead. Christiansborg Castle, which in 1863 was wrecked by an earthquake at the same time of year, felt the force of the disturbance severely. Several of the castle walls and those of the neighbouring European houses were found to be cracked the next day. The critical phase lasted, as far as could be calculated, from thirty to forty seconds. During the period—2.30 a.m. to 3.30 a.m.—there was a variation of temperature of 3°—viz. from 71° to 74°, and *vice versa*. In this interval the wind had completely died away, the atmosphere being hot and almost stifling. It was very difficult to trace the direction of the earthquake, but my own opinion is that it travelled from the south-west, and this is somewhat confirmed by the reports since received from that quarter. Small shocks were repeated at intervals of one hour till seven o'clock in the morning, and on two days since the 12th slight tremors have been felt, but not of sufficient power to do much damage. Since the event the weather has become remarkably cool, considering our proximity to the Equator, the average temperatures being, night and morning, 72°, sun 97°, shade 56°."

THE additions to the Zoological Society's Gardens during the past week include a Bubaline Antelope (*Alcelaphus bubalis* ♀), a Domestic Goat (*Capra hircus*) from Algeria, presented by Mr. Robert Pitcairn; a Black Hornbill (*Buceros atratus*) from West Africa, presented by Mr. J. T. Carrington; two Grey Monitors (*Varanus griseus*) from Arabia, presented by Capt. J. S. Sanderson; four Ural Phrynocephales (*Phrynocephalus helioscopus*) from the east coast of the Caspian, presented by Dr. A. Strauch, F.M.Z.S.; twelve European Tree Frogs (*Hyla arborea*), European, presented by Mr. Carl Schorlemmer; a Cape Hyrax (*Hyrax capensis*) from South Africa, a Great Bustard (*Otis tarda*), European, deposited; an Ocelot (*Felis pardalis*), a King Vulture (*Gypagus papa*), a Brazilian Caracara (*Polyborus brasiliensis*), an Anaconda (*Eunectes murinus*), a Common Boa (*Boa constrictor*) from Brazil, purchased; two Mandarin Ducks (*Ex gulariculata*), two Cockateils (*Calopsitta nova-hollandia*), bred in the Gardens.

GEOGRAPHICAL NOTES

A LETTER from Mr. H. M. Stanley, dated July 14 has been published in New York, in which he reports the discovery of a new lake called Mantumba. He has also explored the river marked in the maps as the Ikelembu, but which is really the Ma'undu, and finds it to be a deep, broad, navigable stream. Stanley expresses his increasing surprise at the density of the population in the equatorial portions of the Congo basin, and says if what he has seen may be taken as representing the state of things generally, there is a population in this river basin of forty-nine millions. Extensive commercial openings are offering themselves.

A TELEGRAM from New York, October 9, states that exploring parties who had just descended the Yukon River, in Alaska, say that they travelled down the stream for two thousand miles. They report the river to be one of the largest in the world, discharging 50 per cent. more water than the Mississippi. Its breadth in some places is seven miles.

THE Austrian African explorer, Dr. Stecker, after five years' absence in the service of the German African Society, has just returned home. For the most part he travelled in company with Herr Gerhard Rohlfs, but Stecker has himself discovered about a dozen countries east and south of Abyssinia, which

before him, no European had ever entered. He was imprisoned as a spy by King Melelek, of Shoa, but was eventually released through the intercession of Marquis Antinori. He has brought back with him numerous valuable maps and a large collection of the fauna, flora, minerals, and other objects connected with the regions he explored.

LIEUT. WISSMANN is preparing to set out on a new expedition to the Upper Congo.

THE United States observing party at Point Barrow have returned to Alaska, *en route* for San Francisco.

THE French war steamer, which was sent out last year with the French scientific mission to Cape Horn, is daily expected with the party, who have spent their winter in this remote part of the world. These observations have been carried on in connection with the Polar observations as organised by the International Conference, and have been made from August, 1882, to August, 1883.

"THE Yearly Report of the Swiss Alpine Club" for 1882, the eighteenth volume of the series, contains many and various contributions towards a fuller knowledge of the Alps. Besides valuable letterpress we are treated to excellent panoramas after original drawings, coloured views, woodcuts, and cartographical sketches.

IN one of a collection of lectures published at Heidelberg, 1883, by the house of Carl Winter, A. von Lasaulx, the well-known geologist, draws an ingenious parallel between Ireland and Sicily, and attempts to explain the backward state of the inhabitants of these two islands and the disorders of which they have been the theatre by the nature of their geological strata, the formation of their coasts and their positions.

THE last number of the *Izvestia* of the Russian Geographical Society, contains, besides minutes of proceedings, two papers by Dr. Woeikof, on the diurnal period of the velocity of the wind in Russia, and on the distribution of heat in the oceans; a paper by Prof. Lenz, on the periodicity of auroras; the annual reports of the western and eastern Siberian branches of the Society; the end of M. Polyakoff's letters from Sakhalin, wherein he describes his journey on boat down the Tym River and on the eastern coast of Sakhalin; and several notes. We notice among these latter a list of forty-two places in Persia, Attak, and Akbal-Tekke, the positions of which were determined by Capt. Gladysheff.

THE EVOLUTIONARY POSITION¹

I HAVE been requested by the Subjects Committee of the Congress to place before you a brief statement of some of the advances which have recently been made in natural science, with a view to open a discussion upon their relations, real or supposed, to religious belief. The particular advances which, as I am given to understand, were especially in the minds of the Committee in proposing this question, are those which have resulted in the more or less general adoption by scientific men of the view of the sequence of events which have taken place, and are still taking place, in the universe, to which the term "evolution" is now commonly applied.

All that is embraced by this term, the various realms of nature in which its manifestations are traced, the various shades of meaning attached to it by different persons, would constitute far too large and complex a subject to be treated of in the time to which addresses to this meeting are wisely restricted. I will therefore select for special consideration the only point in the application of the theory upon which I can speak with any practical knowledge; one which is, however, in the eyes of many of very vital interest. It is the one, at all events, which at the present moment attracts most attention; the new ideas upon it being received with enthusiasm by some, and with distrust, if not with abhorrence, by others.

The doctrine of continuity, or of direct relation of an event to some preceding event according to a natural and orderly sequence is now generally recognised in the inorganic world; and although the modern expansion of this doctrine as applied to the living inhabitants of the earth appears to many so startling, and has met with so much opposition, it is, in a more restricted applica-

tion, a very old and widespread article of scientific as well as of popular faith.

Putting aside, as quite immaterial to the present discussion, the still controverted question of the evidences of the production of the lowest and most rudimentary forms of life from inorganic matter, it may be stated as certain that there is no rational and educated person, whatever his religious beliefs or philosophical views, who is not convinced that every individual animal or plant, sufficiently highly organised to deserve such distinctive appellation, now existing upon the world, has been produced from pre-existing parents by the operation of a series of processes of the order to which the term natural is commonly applied; processes also fundamentally the same throughout the whole range of living beings, however much modified in detail to suit the various manifestations under which those beings are presented to us. We feel absolutely certain, when we see a horse, a bird, a butterfly, or an oak tree, that each was derived from pre-existing parents more or less closely resembling itself. Though we have no direct evidence of the fact in each individual case, the knowledge derived from the combined observations of an overwhelming number of analogous cases is of such a positive character, that we should entirely refuse to credit any one who made the contrary assertion, and should feel satisfied that he had been deluded by some error of observation. We cannot, indeed, conceive of the sudden beginning of any such creatures, either from nothing, from inorganic matter, or even from other animals or plants totally unlike themselves.

To persons whose opportunities of observation of animal and plant life are limited to a comparatively few kinds, existing under comparatively similar circumstances, and which observations moreover only extend over a comparatively limited period of time, it appears that in each kind of animal or plant, such as those just mentioned, individuals of various succeeding generations present a very close resemblance to each other. That they often vary a little cannot escape careful observation, but the deviations from the common characters of the kind to be noticed by persons whose range of vision is thus limited are not striking, and usually appear not to pass beyond certain bounds. Hence arose the common idea, natural enough under such circumstances, but which gradually developed itself, not only into a scientific hypothesis, but even, it would appear, almost into an article of religious belief, that the different kinds or "species," as they are technically called, of animals and plants, had each its separate origin, its fixed limits of variation, and could not under any circumstances become modified or changed into any other form.

This idea became deeply rooted in the human mind, in consequence of the very long period during which it prevailed, the horizon of observation having remained practically stationary from the time man first began to observe and record the phenomena of nature until little more than a century ago, when commenced that sudden expansion of knowledge of the facts of the animal and vegetable world which has been steadily widening ever since. Now it is important to observe that it is strictly *pari passu* with the growth of knowledge of the facts, that the theoretical views of nature have changed, and the older hypothesis of species to which I have referred has gradually given way to a new and different one.

The expansion of the special branches of knowledge affecting our views upon this subject has taken place in many different directions, of which I can here only indicate the most striking.

1. The discovery of enormous numbers of forms of life, the existence of which was entirely unknown a hundred years ago. The increase of knowledge in this respect is something inconceivable to those who have not followed its progress. Not only has the number of well defined species known multiplied prodigiously, but infinite series of gradations between what were formerly supposed to be distinct species are being constantly brought to light. The difficulty of giving any satisfactory definition of what is meant by the term "species" is increasingly felt day by day by practical zoologists, as evidenced by the introduction of such terms as "sub-species," "permanent local variety," &c., into general use, and especially by the wide differences of opinion as to the number or limits of the species included in any given group of animals or plants among naturalists who have made such group their special study.

2. Vast increase in the knowledge of the intimate structure of organic bodies, both as revealed by ordinary dissection and by microscopic examination, a method of investigation only brought to perfection in very recent years. By the knowledge thus acquired has been demonstrated the unity of plan pervading, under diverse modifications, the different members of each

¹ The following address by Prof. Flower, F.R.S., President of the Zoological Society, was given at the recent Church Congress as introductory to a discussion on "Recent Advances in Natural Science in their Relation to the Christian Faith." The address has been revised by the author.